the higher nations this element becomes more and more distinctly marked, till the expectation of future reward and the fear of future punishment becomes one of the great motives of human life.

Third, when theology among the rudest tribes is mostly confined to consideration of ghosts, demons, and nature-spirits, the intercourse with these leads to little inculcation of moral action. It is when ideas of the great deities become predominant, when men's minds are turned to the beneficent action of the sun, or heaven, or earth, or to a Supreme Deity yet above these, that it is conceived that the order of nature includes moral order of human conduct. Then, as in the religion of ancient China, the universe and its Supreme Deity are regarded as furnishing the model and authority regulating man's actions towards his kindred and his subjects. Thus appears, not in the beginning, but in the middle of the development of religious ideas among mankind, the leading principle of a moral government of the world and its inhabitants.

In these three ways it appears from the evidence of ethnology that the vast transition was made from the earlier unethical to the later ethical systems of religion. Its course, so different from that imagined by the older speculative theologians, has to be ascertained from examination of the actual stages through which the religions of the world have passed. The very attempt to make this investigation on a basis of facts is, however, a novelty.

SCIENTIFIC SERIALS

THE *Monthly Microscopical Journal* commences with an article, illustrated with a plate, "On Organic Bodies in Fire Opal," by Mr. H. J. Slack, in which the author, from the appearances which he finds and describes, expresses an opinion, though not a decided one, that these minute bodies may be vegetable fossils, possibly algæ, though the evidence he adduces is extremely slight. Dr. G. W. Royston Pigott continues his researches on the high-power definition of organic particles, and re-affirms that the generally received description of the Podura scale is erroneous, on account of the employment of spherically over-corrected objectives.—Mr. Wenham criticises Dr. Pigott's paper in the preceding number of the Journal, remarking truly that the patience of microscopists must eventually become exhausted by the repetition of the same theme. He then shows that Dr. Pigott claims, without foundation, discoveries with regard to the improvement of object-glasses and the "colour test."—Dr. Maddox, On the apparent relation of nerve to connective-tissue corpuscles, &c., in the Frog-Tadpole's Tail, describes, in connection with the observations of Eberth, Kuhne, and Moseley, cases in which nerve-fibres seem to lose themselves in connective tissue corpuscles. His results are not very decided, and hardly tend to settle the question.—Mr. Edwin Smith describes a new substage for the microscope, and certain appliances for illumination.—The paper read before the Royal Society, by Messrs. Pode and Lankester, is given in full. Their experiments are divided into eight series, in which infusions of hay and turnip, mixed or unmixed, with cheese finely divided or in lumps, are boiled and some of them sealed. When the cheese was finely comminuted, Bacteria did not appear; when in lumps, they were frequently found. In a boiled turnip infusion, placed in a retort of which the end was left open, there was no cloud developed after many weeks, which is quite contrary to the observations of Dr. Bastian (NATURE, Feb. 6, p. 275.)

THE *Geological Magazine* contains Prof. T. Sterry Hunt's article from the *Canadian Naturalist*, on the history of the names Cambrian and Silurian in Geology. The subject is divided into three parts: 1. The history of Silurian and Upper Cambrian in Great Britain from 1831 to 1854. 2. That of the still more ancient rocks in Scandinavia, Bohemia, and Great Britain up to the present time. 3. The history of the Lower Palæozoic rocks in North America.—Mr. E. Hardman describes and gives analyses of the Siliceous Nodular Brown Hæmatite (Göthite) in the Carboniferous Limestone Beds near Cookstown, Co. Tyrone. The ore contains as much as 52·2 per cent. of iron, on the average, and no sulphur.—Mr. J. C. Mansel-Pleydell has a brief memoir on the geology of Dorsetshire, which is an interesting summary of the most important points in the unbroken series from the Liassic to the Quaternary formations found in the county.—Mr. Joshua Wilson, in endeavouring to arrive at the time when the Gulf Stream reached the British Coast and so dispersed the then abundant glaciers, ingeniously shows that a raised beach, containing Arctic shells, mentioned by Geikie in his "Scenery of Scotland," must have been produced before that event, otherwise i would have been removed by the *offshore* under-current which always accompanies an onshore wind.—Dr. Winkler's description of *Pterodactylus micronyx* in the Jeyler Museum, from the Lithographic Stone of Eichstätt, in Bavaria. The specimen is very small and complete. There are four phalanges in the long finger of the hand. In the foot there are two in hallux; three on the second and third; and two, with no metatarsus, on the fourth (Stümmel).—In a letter to the editor, Mr. T. W. Danby, after comparing the new method of writing crystallographic formulæ proposed by Mr. Rutley, shows that it is not so advantageous as that of Dr. Whewell, modified by Prof. W. H. Miller; it is therefore doubtful whether its partial acceptance will not place a further obstacle in the student's path.

THE numbers of the *Journal of Botany* for August, September, and October, fully maintain the character of this magazine. In addition to the short notes and queries in each number, which often contain points of great interest to the systematic or physiological botanist, the following articles may be mentioned as of special value:—Dr. Alfred Nathorst, of the Geological Survey of Sweden, contributes a paper on the Distribution of Arctic plants during the Post-Glacial Epoch, which he considers to exhibit gradual changes of climate from the Forest-bed down to the Boulder-clay.—Prof. Church gives an analysis of the giant puff-ball, *Lycoperdon giganteum*, which he finds to contain, when dried, as much as 66·78 per cent. of albuminoids, and the ash 46·19 per cent. of phosphorus pentoxide.—Mr. J. G. Baker describes a very interesting new genus of ferns, *Diplora*, of the tribe *Aspleniæ*, from the Solomon Islands.—From the same botanist we have a valuable synopsis of the East Indian species of *Dracæna* and *Cordyline*.—Mr. J. Ball commences a description of some of the new species, sub-species, and varieties of plants collected by Dr. Hooker and himself in Morocco in 1871; the flora belongs essentially to the Mediterranean type, and the number of novelties is not comparatively large.—Mr. Carruthers gives his very valuable annual Review of the Contributions to Fossil Botany published in Britain in 1872, comprising 23 distinct papers or abstracts.—In these numbers we have also parts vi. and vii. of the Rev. E. O'Meara's Recent Researches in the Diatomaceæ.

THE second part of vol. xxix. of the *Transactions of the Linnæan Society*, just published, is occupied by a continuation of Colonel Grant and Prof. Oliver's "Botany of the Speke and Grant Expedition." The number of new species described in this part is thirty-five; and it is illustrated by thirty-five full-sized 4to plates, the expense of which is munificently borne by Col. Grant.

Der Naturforscher, August.—The eruption of Vesuvius last year attracted much scientific observation, and we have in the present serial an abstract of a valuable paper by M. Heim on the nature and formation of lava, of which he distinguishes two kinds, "lump" lava and "cake" lava (*Schollen* and *Fladen*), differing, he found, not in chemical constitution, but merely in vapour-contents. In the physical division we may note M. Wiedemann's experiments in measuring the elliptical polarisation from reflection on bodies with surface colours, for a series of angles of incidence, and different parts of the spectrum. Meteorology is represented by M. Dufour's recent observations on reflection of solar heat from the Lake of Geneva; and an interesting paper entitled "Polar Lights and Earth Lights." There is a description of M. Zöllner's new mode of estimating the absolute temperature of the sun, which is based simply on a knowledge of the density relation between two different layers of the hydrogen atmosphere, the distance between them being known. The value his formula gives is 61350°. Among botanical subjects treated are, autumn colouring of leaves and formation of vegetable acids, summer dryness of our trees and shrubs, and passage of radiant heat through leaves. Some physiological experiments by M. Rosenthal, on the time-relations of reflex phenomena, are described; and there is a variety of other matter, much of which has already been noticed in these columns.

Annalen der Chemie und Pharmacie. Band. clxviii. Heft. 1, July 16.—The number opens with four papers by Prof. Ad. Claus, on azophenylen, on di-iodhydrin, on the action of ammonia on dichlohydrin, and on the preparation of dichlorhydrin. The first of these contains a long and exhaustive account of the body in ques-

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tion and of its compounds. The formula of azophenylen is $C_{12}H_8N_2$. By the action of ammonia on it a body having the formula $C_{12}H_{10}N_2$ is produced.—On diiodhydrin, by the same author. This body has the formula $C_3H_6I_2O$.—On the action of ammonia on dichlorhydrin, by the same. The result of the action is the production of chlorhydrinimid, a body of the formula $C_{12}H_{27}N_3Cl_2O_4$. —Preparation of dichlorhydrin, by the same. The method consists in acting on glycerin with chloride of sulphur.—Application of the periodic law to the cerium group, by D. Mendelejeff. —On the preparation of ethylen and its bromide, by E. Erlenmeyer and H. Bunte.—On the action of nascent hydrogen on the oil of bitter almonds, by Hugo Amann.—On the bromised benzol sulpho acids, by A. Woelz. The author has prepared dibrombenzol sulpho-acid, and gives an account of its salts and of its reaction with fused potassic hydrate.—An investigation of piperin and its products of decomposition, piperic acid and piperidin, by R. Fittg and I. Remsen.—On ethylen-protocatechuic acid by the same author, and T. Macalpine.—New compound of the Naphthalin group, by J. P. Battershall.—On the action of a mineral sulphur water on cast-iron, by Dr. E. Priwoznik. The author found an iron water-pipe, through which this water passed converted as regards its inner side into a mixture of sulphide of iron, hydrated oxide of iron and free sulphur. The centre stratum was also altered, containing only 79·2 per cent. of iron.—On sulph-hydantoin (glycolyl-sulpho-urea) by R. Maly.—Determination of boiling points at the normal barometric pressure, by Dr. H. Bunte.—Preparation of trimethyl-carbinol, by Linnemann's method, by A. Butlerow.

SOCIETIES AND ACADEMIES

LONDON

Royal Microscopical Society.—The opening meeting of the session was held at King's College, Oct. 1, C. Brooke, F.R.S., president, in the chair.—The secretary read a paper by Dr. Maddox descriptive of an organism found in a pond of fresh water in the New Forest, near Lyndhurst, which it was proposed to name *Pseudo-amœba violacea*. The general appearance of the organism was minutely described and figured, and the results of a series of continuous observations upon a growing slide under the microscope were detailed.—A paper by Mr. F. Kitton, of Norwich, describing some new species of Diatoms, was taken as read, and the attention of the meeting was called by the president to one of great beauty named by Mr. Kitto *Aulacodiscus superbus*.—Mr. F. H. Wenham made some interesting observations upon the microscopical appearance of glass which had been subjected to the action of the American sand-blast process, showing that the erosion of the surface was entirely due to the percussive force of the particles of sand, and that the results of this were demonstrated by the polariscope. A number of specimens were exhibited in the room.—Mr. C. Stewart, the hon. sec., exhibited under the microscope, and minutely described, a beautiful preparation of the spermatophores of the common squid; he also explained and illustrated the general structure of the generative organs of the male cuttle-fish.

PHILADELPHIA

Academy of Natural Sciences, April 3.—*Conchological Section.*—Dr. W. S. W. Ruschenberger, in the chair.—Dr. F. A. Hassler presented the following memorandum of experiments by W. M. Gabb and himself to ascertain the tenacity of life in *Littorina muricata*. The specimens, 140 in number, were collected by Mr. Gabb in St. Domingo, September 1870, and hung in a basket in his office. A few (five or six) were moistened after three months, then each month until May 1871, when all were alive. May, June, July, and August, 1871, 25 were moistened each month, and all found to be living except two in July and two in August. These were each month laid aside and not moistened again until September. At this time 40 of the original lot remained, all were moistened, and 29 found to be alive. In September, of the 100 which had been moistened during May, June, July, and August, 89 were alive. The 118 living ones were all placed together Feb. 18, 1872, the lot was again moistened and about 60 revived at once, and after several hours all but 24 were or had been crawling. These 24 were rejected. March 30, 1872: of the remaining 94, ten were moistened, nine were alive; these nine were placed aside with a few which had given evidence of life since the last experiment, Feb. 18. Sept. 18, 1872: all moistened and found living; they were also all alive in December. On Feb. 12, 1873, two found to be dead, and were separated from the others. March 26: All moistened, and though exposed for three days, only one began to crawl; this one was separated, also 27 others which were known to be dead, leaving 65 undetermined.

PARIS

Academy of Sciences, Sept. 29.—M. Bertrand in the chair. —The following papers were read:—Notes on the yellow elastic tissue, and remarks on its history in relation to a memoir by M. Bouillaud, and some criticisms on it by M. Bouley, by M. E. Chevreul.—Researches on the elastic tissue of the elephant and the ox, by M. Chevreul.—New researches on the analysis and theory of the pulse, by M. Bouillaud. The author continued his former papers on this subject, dealing with the abnormal pulse in this paper.—Remarks on M. Bouillaud's late paper on the pulse, by M. Bouley.—Reply to M. Bouley by M. Bouillaud. —Remarks on No. 21 of the "Mémorial de l'officier du Génie," by General Morin. The general drew attention to many interesting notes on the late sieges of Paris, contained in this number.—Note on magnetism, by M. J. M. Gaugain. This was a fourth instalment of the author's paper.—On the part played by gases in the coagulation of albumin, by MM. E. Mathieu and V. Urbain.—On a new method of treating cholera, and probably yellow fever, by means of sub-cutaneous injections of carbolic acid and carbolate of ammonia, by M. Déclat. The author recommended drinks containing carbolic acid in doses of from thirty to forty centigrammes per day, and from four to six injections of five grammes each of carbolic acid solution (2½ per cent.). These doses are to be largely increased in severe stages of the disease.—Comparison of the *Phylloxeræ vastatrix* of galls with those of roots, by M. Max. Cornu.—On the size and variation of the sun's diameter, by S. Respighi. The author, in his letter, discussed Secchi's late observations on the same subject.—On the action of the respiratory apparatus after an opening of the thoracic wall, by MM. G. Carlet and J. Straus.—On the classification of the fish of the family of *Triglidæ*, by M. H. E. Sauvage. —Researches on the action of heat on the carbuncular virus, by M. C. Davaine.—On a deposit of *Endogenites echinatus* in the Museum (fossil vegetable collection), by M. E. Robert.—On the influence of sulphates in the producton of goitre in relation to an epidemic form of that disease in a barrack at St. Etienne, by M. Bergeret.

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ERRATA.—Vol. viii. p. 480 1st col. l. 23 from bottom, for "Kerson's" read "Henson's"; l. 14, for "Montague" read "Montagne."

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